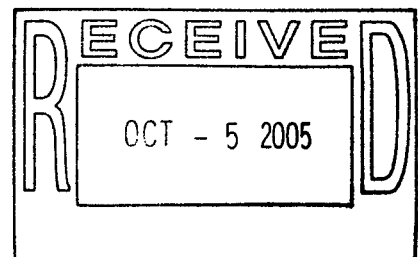


**Draft Closeout Report
for IHSS Group SW-2
Original Landfill (IHSS 115) and
Water Treatment Plant Backwash (IHSS 196)**



September 2005

ADMIN RECORD

IA-A-002855

11/15

**Draft Closeout Report
for IHSS Group SW-2
Original Landfill (IHSS 115) and
Water Treatment Plant Backwash (IHSS 196)**

Approval received from the Colorado Department of Public Health and Environment on

(_____).

Approval letter contained in the Administrative Record.

September 2005

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LIST OF ATTACHMENTS

Attachment A – Construction Completion and Certification Report Accelerated Action for the Original Landfill Rocky Flats Environmental Technology Site, Text and Appendices A - J

Acronyms

AL	action level
AR	Administrative Record
CAD/ROD	Corrective Action Decision/Record of Decision
CCCR	Construction Completion and Certification Report Accelerated Action for the Original Landfill Rocky Flats Environmental Technology Site
CRA	Comprehensive Risk Assessment
cy	cubic yards
DOE	U.S. Department of Energy
DU	depleted uranium
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ft	foot or feet
FY	Fiscal Year
HRR	Historical Release Report
IA	Industrial Area
IHSS	Individual Hazardous Substance Site
IM/IRA	Interim Measure/Interim Remedial Action
kg	kilogram
K-H	Kaiser-Hill Company, L.L.C.
NFAA	No Further Accelerated Action
OLF	Original Landfill
OU	Operable Unit
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS or Site	Rocky Flats Environmental Technology Site
RFI/RI	RCRA Facility Investigation/Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
SID	South Interceptor Ditch
SW	Southwest
TCE	trichloroethene
WRW	wildlife refuge worker

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EXECUTIVE SUMMARY

This Closeout Report summarizes accelerated action activities conducted at Individual Hazardous Substance Site (IHSS) Group SW-2 at the Rocky Flats Environmental Technology Site (RFETS or Site) in Golden, Colorado. IHSS Group SW-2 consists of the Original Landfill (OLF) and the Water Treatment Plant Backwash (Filter Backwash Pond) IHSSs.

Closure of IHSS Group SW-2 was conducted in accordance with the Final Interim Measure/Interim Remedial Action (IM/IRA) for the Original Landfill (Including IHSS Group SW-2; IHSS 115, Original Landfill and IHSS 196, Filter Backwash Pond) (DOE 2005a) and with the Final Design Report and Design Calculation Documentation for the Accelerated Action for the Original Landfill at the Rocky Flats Environmental Technology Site approved by the Colorado Department of Public Health and Environment (CDPHE) on May 13, 2005 (CDPHE 2005) (DOE 2005b). Closure activities primarily included the removal of surface soil "hot spots", removal of monitoring wells, removal of an abandoned natural gas pipeline, waste regrading, re-grading of fill, buttress construction, placement of a 2-foot-thick soil cover over the entire fill area, construction of surface water berms and channels, and revegetation of disturbed areas.

Attachment A of this Closeout Report includes the Construction Completion and Certification Report (CCCR) Accelerated Action for the Original Landfill Rocky Flats Environmental Technology Site. This Closeout Report and associated documentation will be retained as part of the Rocky Flats Administrative Record (AR) file.

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1.0 INTRODUCTION

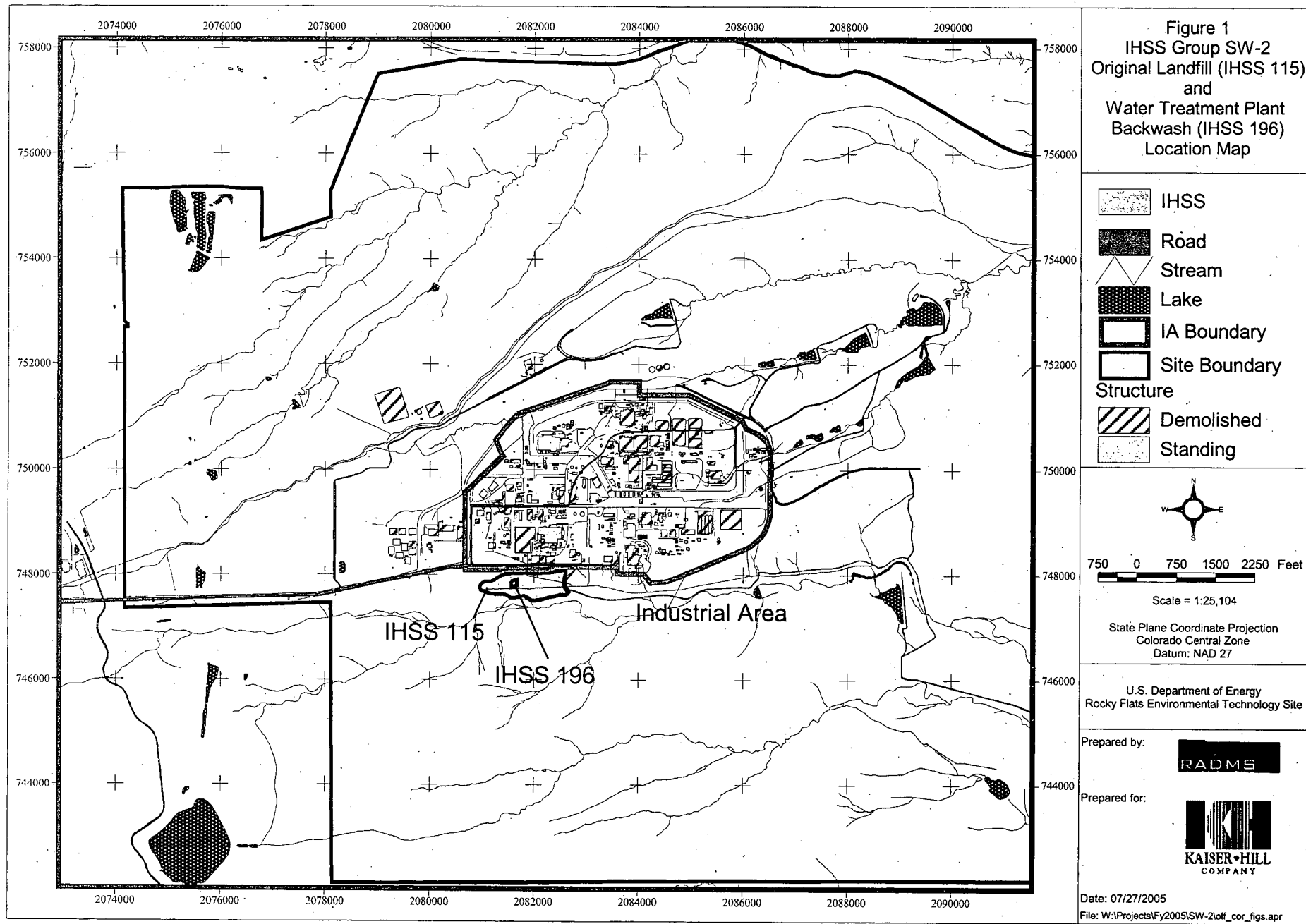
This Closeout Report summarizes accelerated action activities conducted at Individual Hazardous Substance Site (IHSS) Group SW-2 at the Rocky Flats Environmental Technology Site (RFETS or Site) in Golden, Colorado. IHSS Group SW-2 consisted of the Original Landfill (OLF) and the Water Treatment Plant Backwash (Filter Backwash Pond) IHSSs.

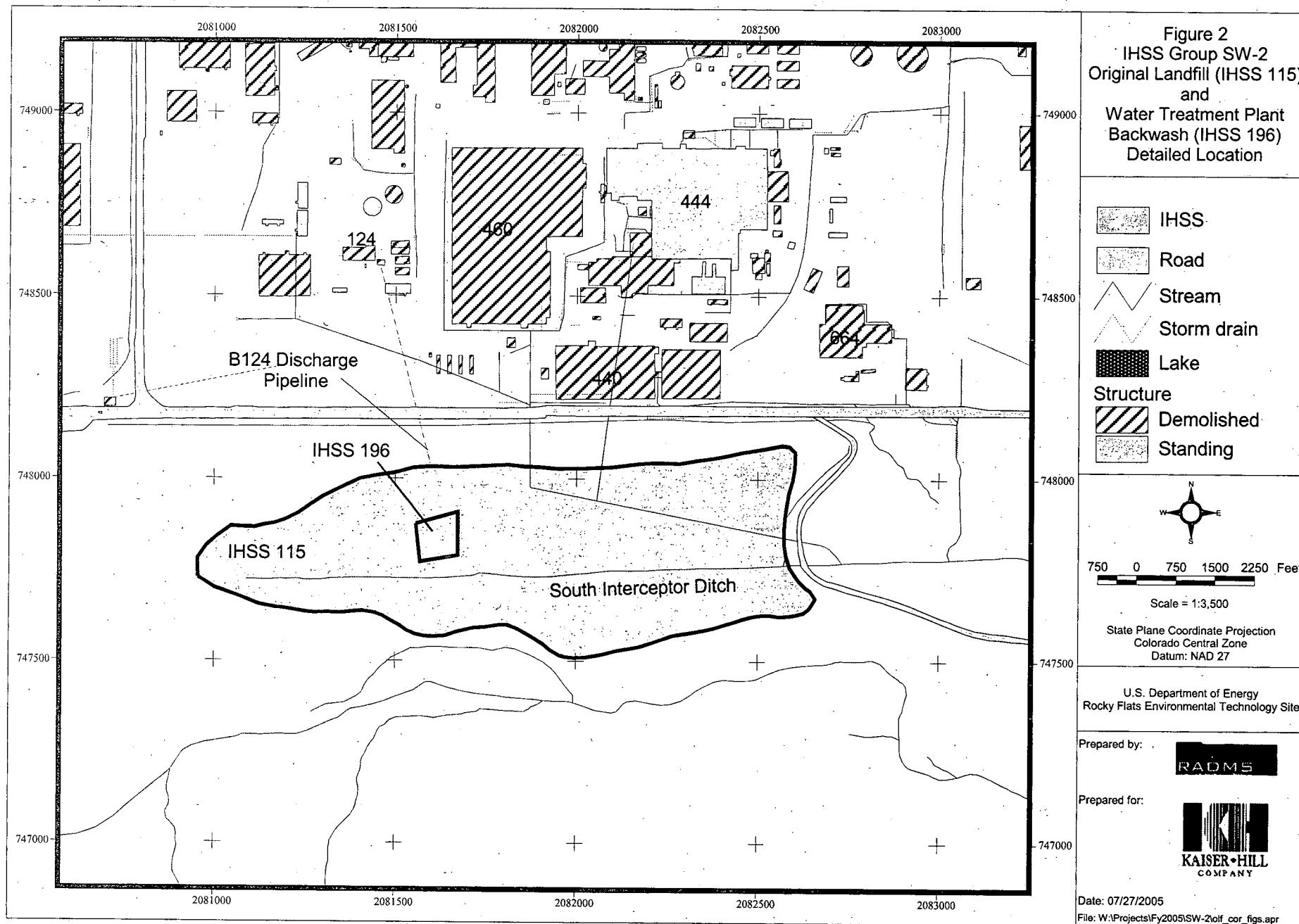
Figure 1 shows the location of IHSS Group SW-2 and Figure 2 gives a more detailed look at the Original Landfill and the Water Treatment Plant Backwash area.

Accelerated action activities were executed as documented in the Construction Completion and Certification Report (CCCR) Accelerated Action for the Original Landfill Rocky Flats Environmental Technology Site (Attachment A). Closure activities primarily included the removal of surface soil "hot spots", removal of monitoring wells, removal of an abandoned natural gas pipeline, waste regrading, re-grading of fill, buttress construction, placement of a 2-foot-thick soil cover over the entire fill area, construction of surface water berms and channels, and revegetation of disturbed areas.

Planned activities were documented in the Final Interim Measure/Interim Remedial Action (IM/IRA) for the Original Landfill (DOE 2005a) and in accordance with the Final Design Report and Design Calculation Documentation for the Accelerated Action for the Original Landfill at the Rocky Flats Environmental Technology Site approved by the Colorado Department of Public Health and Environment (CDPHE) on May 13, 2005 (CDPHE 2005) (DOE 2005b). Ecological effects will be evaluated in the ecological risk assessment portion of the Sitewide Comprehensive Risk Assessment (CRA).

Approval of this Closeout Report constitutes regulatory agency concurrence that IHSS Group SW-2, Original Landfill (IHSS 115) and Water Treatment Plant Backwash (IHSS 196) are No Further Accelerated Action (NFAA) Sites. This information and NFAA determination will be documented in the Fiscal Year (FY) 2005 (05) Annual Update for the Historical Release Report (HRR).





1.1 IHSS Group SW-2 Site Description and Background Information

IHSS Group SW-2 covers approximately 20 acres and includes two IHSSs: IHSS 115, the OLF, and IHSS 196, the Water Treatment Plant Backwash (Filter Backwash Pond). IHSS 115 is located south of the RFETS Industrial Area (IA) pediment on a south-facing hill slope north of Woman Creek. IHSS 196 lies approximately in the center of IHSS 115.

Approximately 1,000 feet of the South Interceptor Ditch (SID), the storm drain and building footer drain discharge pipes, and other disturbed areas lie within IHSS 115. These IHSSs were formerly part of Operable Unit (OU) 5, Woman Creek Priority Drainage. An OU 5 Phase I Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation (RFI/RI) was conducted in accordance with an approved work plan; a draft final report was issued in April 1996 (DOE 1996) (DOE 2005a).

1.1.1 OLF (IHSS 115)

The OLF was used to dispose of solid sanitary and construction debris wastes generated at RFETS from 1952 to 1968. The landfill was not designed or operated as an engineered landfill. Aerial photographs indicated that the landfill was operated as a fill area. Waste was dumped in the area below and just south of the southern edge of the alluvial pediment on which the RFETS IA is located. The waste was generally spread over the south-facing hillside, serving to fill in the area below the pediment edge. No liner or other collection barrier was installed between the waste and the existing surfaces (DOE 2005a).

In the waste placement process, the waste material was mixed with soil. The volume of disposed waste and commingled soil was estimated at 160,000 cubic yards (cy). Because of the slope angle, and the geological mapping and characterization of the colluvial and weathered bedrock material making up the hillside, the hillside in this area was identified as susceptible to sliding even before the slope was covered with waste fill (DOE 2005a).

Disposal operations at the OLF ceased by the fall of 1968 possibly due to the opening of the Present Landfill (IHSS 114, located north of the IA) which began operating on August 17, 1968. The OLF waste material was covered with a soil layer after disposal operations ceased. Details on the placement of the soil cover layer, including exactly when it was constructed, are not available. Portions of the slope on the southern side of the landfill were later regraded to correct sloughing and erosion problems. Accurate and verifiable records of the wastes placed in the landfill are not available. However, approximately 74,000 cy of sanitary waste and construction debris were disposed in the landfill (DOE 1996). These types of wastes likely included relatively small quantities of organics, paint and paint thinner, oil, pesticides, and cleaners. Commonly used organics from 1952 to 1968 may have included trichloroethene (TCE), carbon tetrachloride, tetrachloroethene (PCE), petroleum distillates, 1,1,1-trichloroethane, dichloromethane, and benzene (DOE 1996). In the 1960s, the landfill may have received polychlorinated biphenyl (PCB) wastes (DOE 1992), such as carbonless copy paper, transformer and vacuum pump cleanup paper and rags, small capacitors, and fluorescent light bulbs. Metals such as beryllium, lead, and chromium, may also have been placed in the landfill (DOE 2005a).

There is no information indicating that the OLF was used for routine disposal of radioactive material or other hazardous substance waste streams. Although the OLF was not operated for management or disposal of radioactive waste, information in the HRR and characterization

results indicated that some waste contaminated with radioactive material, most notably wastes from buildings where depleted uranium (DU) operations were conducted, were disposed in the OLF. In addition, in 1965, 60 kilograms (kg) of DU were placed in the landfill after the DU, which was left on a pallet, reportedly ignited on a flatbed truck. The DU was probably covered with soil to extinguish the fire. Efforts were later made to retrieve the DU, however, only 40 kg were recovered. Further use of the affected area of the landfill was avoided. Further removal of DU in contaminated surface soil was completed in August 2004 leaving surface soil activities below the action levels (ALs) (DOE 2005a).

In 1995, geotechnical investigations were conducted at the OLF as part of the OU 5 Phase 1 RFI/RI. Several discrete landslides as well as general areas of sliding were defined during the investigation and it was concluded that landsliding is endemic to slopes underlain by claystone bedrock in the RFETS region (Metcalf & Eddy 1995). Investigators documented the fill material that was encountered. The material consisted of waste mixed with varying amounts of sandy, clayey gravel and cobbles derived from colluvium and Rocky Flats Alluvium. The waste materials in the fill included sheet metal, wood, broken glass, plastic, rubber, metal shavings, graphite sand, solid blocks of graphite, concrete, asphalt, and portions of 55-gallon steel drums. The waste fill ranged in thickness from 2 ft to over 11 ft (DOE 2005a).

A follow-up geotechnical investigation was completed in 2004 to further define the level of landfill stability and to support the accelerated action design. Results of the follow up investigation indicated no current evidence of landsliding or mass movement of the waste fill and soil; however, aerial photographs of the area prior to waste disposal suggested that the pre-landfill slope exhibited signs of previous instability and natural erosion. The current surface, in 2004, contained areas of sloughing and erosion resulting from historic landslides in the area prior to waste placement, poor waste management practices, and erosion and subsequent slope instability caused by poor surface water controls (DOE 2005a).

Seepage emerging from the OLF after a major rainstorm in July 1986 was traced to an outfall pipe from the Building 460 footing drains. Sloughing of material in the area of the outfall occurred as a result and the hillside materials may have been washed into the SID. To prevent migration of materials, a containment embankment was constructed to prevent flow into Woman Creek. The outfall piping was also extended to the east to discharge beyond the landfill boundary (DOE 2005a).

1.1.2 Water Treatment Plant Backwash (IHSS 196)

The water treatment plant backwash (IHSS 196) was located on the hillside north of Woman Creek, approximately 800 ft south of the water supply treatment plant in Building 124. The treatment plant treated water that was delivered from the Denver Water Board reservoir and ditch system to the raw water pond located north of the West Access Road to produce the plant's potable water. The water treatment plant backwash (IHSS 196), also known as Pond 6, was used as a retention pond to allow sampling of filter backwash water. It was also described as an evaporation and settling pond. There is no record of sludge or sediment removal from the pond (DOE 1992).

Pond 6 was constructed in 1955. However, water from the water treatment plant was discharged at the OLF before the pond was constructed. The Original 1992 HRR (DOE

1992) refers to an October 1954 reference that indicated backwash water from the water treatment plant flowed through the western side of the burning pit and down to Woman Creek. It is possible that Pond 6 was constructed in the location of the burning pit (DOE 1992). It is unclear when Pond 6 and the water treatment plant backwash was abandoned, but, by 1964, Pond 6 was no longer present and the area was covered with fill (DOE 1996).

The effluent from the water treatment plant was discontinuous and probably made up of filter backwash, filter pre-wash, sludge blowdown, and other discharges from the water treatment process. It contained filterable solids removed from the raw water, as well as chemical flocculants (aluminum sulfate or lime) and residual chlorine (DOE 1992).

2.0 ACCELERATED ACTION

The IHSS Group SW-2 remedial action objectives (RAOs) (DOE 2005a) were developed to:

- Prevent direct contact with landfill soil and commingled waste, and
- Control erosion caused by stormwater run-on and runoff.

The remedial action plan for the IHSS Group SW-2 consisted of the following major activities to meet RAOs:

- Removal of surface soil “hot spots”;
- Grading of landfill to slope of 18 percent;
- Construction of a soil buttress;
- Placement of a 2-foot-thick soil cover over the entire waste area;
- Construction of surface water diversion berms and perimeter channels;
- Site monitoring (groundwater and surface water); and
- Institutional controls.

The objectives of this action were principally met through the removal of the surface soil that was contaminated above the wildlife refuge worker (WRW) soil ALs.

To achieve the remaining objectives, an engineered soil cover was designed to prevent direct contact with landfill soil and commingled waste and control erosion caused by stormwater run-on and runoff (DOE 2005a).

Environmental Restoration (ER) accelerated action activities were conducted between February 2005 and August 2005. Starting and ending dates of significant activities are listed in the Final Detailed Schedule shown on Figure 4 of the CCCR (Attachment A). Photographs of site activities are presented in Appendix C of the CCCR (Attachment A).

2.1 Summary of Present Landfill Accelerated Action

Section 4.0 of the CCCR presents the summary of the accelerated action, including a general description of the various construction items. The following text presents a general chronological order for the construction activities that took place at the OLF site (Attachment A):

- Mobilization and preparatory activities (Section 4.1);
- Stripping, clearing and grubbing at the OLF (Section 4.2);
- Waste removals and relocation (Section 4.3);
- Buttress construction (Section 4.4)
 - Excavation and subgrade preparation,
 - Drain rock layer,
 - Compacted buttress fill;
- Placement of grading fill (Section 4.5);
- Placement of cover soil (Section 4.6);
- Diversion ditch construction (Section 4.7)
 - Diversion berms,
 - Down slope outfall channels;
- Revegetation at the OLF (Section 4.8);
- Erosion control matting (Section 4.9);
- New groundwater monitoring well installation (Section 4.10); and
- Summary of material quantities (Section 4.11).

3.0 RCRA UNIT CLOSURE

IHSS Group SW-2, the Original Landfill (IHSS 115) and the Water Treatment Plant Backwash (IHSS 196), is not a RCRA unit.

4.0 CHANGE MANAGEMENT

A formalized change management process described in the Design Analysis Document (DOE 2005b) was strictly adhered to in order to document all revisions and clarifications during construction. Appendix E of the CCCR provides copies of the design change records (Attachment A).

5.0 STEWARDSHIP ANALYSIS

The IHSS SW-2 stewardship evaluation was conducted through ongoing consultation with the regulatory agencies.

5.1 Current Site Conditions

As discussed in Section 2.1, accelerated actions at IHSS Group SW-2 consisted of the removal of surface soil “hot spots”, removal of an abandoned natural gas pipeline, waste grading, monitoring well installation, placement of re-grade soil fill, buttress construction,

placement of a 2-foot-thick soil cover, construction of surface water diversion berms and perimeter channels, and revegetation of disturbed areas.

5.2 Post-Accelerated Action Monitoring and Long-Term Surveillance and Maintenance

Post-accelerated action monitoring and long-term surveillance and maintenance considerations are addressed in Appendix B of the Final IM/IRA for the Original Landfill. The Final IM/IRA describes the following requirements for maintaining the final cover (DOE 2005a):

- Maintain the integrity and effectiveness of the final cover, including making repairs to the cover as necessary to correct the effects of settling, subsidence, erosion, or other events;
- Maintain and monitor the groundwater monitoring system and comply with all other appropriate requirements; and
- Prevent run-on and runoff from eroding or otherwise damaging the final cover.

Potential surface water impacts and water quality monitoring requirements are addressed in Table 1 of Appendix B of the Final IM/IRA for the Original Landfill. The table describes the requirements for monitoring the cover, berms and swales, surface water, groundwater, and the institutional and physical controls (DOE 2005a). The required performance monitoring wells were installed per the Final IM/IRA for the OLF as part of the OLF accelerated action project. Results from the performance monitoring wells will be reported in the RFETS Integrated Monitoring Plan (IMP) Report.

IHSS Group SW-2 will be evaluated as part of the Sitewide CRA. The CRA is part of the Remedial Investigation/Feasibility Study (RI/FS) that will be conducted for the Site. The need for and extent of any more general, long-term stewardship activities will also be analyzed in the RI/FS and proposed as part of the preferred alternative in the Proposed Plan for the Site. Institutional controls and other long-term stewardship requirements for the Site will ultimately be contained in the Corrective Action Decision/Record of Decision (CAD/ROD) and any post-RFCA agreement. This Closeout Report and associated documentation will be retained as part of the RFETS AR file.

6.0 DEVIATIONS

Summaries of the design changes, clarifications and revisions during construction as well as the field changes are found in Section 5.0 of the CCCR (Attachment A).

7.0 POST-ACCELERATED ACTION CONDITIONS

Construction was completed in accordance with the design set forth in the Accelerated Action Final Design for the Original Landfill, Construction QA/QC Plan (Appendix A of the CCCR) and the subsequent addenda created during construction (Attachment A). Appendix C of the CCCR contains project photographs.

8.0 SITE RECLAMATION

The OLF was seeded, straw crimped and hydro mulched. Erosion mat (degradable and permanent) was placed in surface water flow areas. Native seed mix was used on the cover. Sections 4.8 and 4.9 of the CCCR contain more detailed site reclamation information (Attachment A).

9.0 CONCLUSIONS

Results of the accelerated action justify NFAA for IHSS Group SW-2, the Original Landfill (IHSS 115) and the Water Treatment Plant Backwash (IHSS 196). Justification is based on the successful completion of the surface soil "hot spot" removal and the implementation of the approved closure design over the entire IHSS 115 area.

10.0 REFERENCES

CDPHE, 2005, Correspondence to J. Legare, DOE, RFFO; from S. Gunderson, CDPHE; RE: Original Landfill Design (May 2005), May 13.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 1996, Final Phase I RFI/RI Report, Woman Creek Priority Drainage, Operable Unit 5, Volume 1, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2005a, Final Interim Measure/Interim Remedial Action for the Original Landfill (including IHSS Group SW-2; IHSS 115, Original Landfill and IHSS 196, Filter Backwash Pond), Rocky Flats Environmental Technology Site, Golden, Colorado, March 10.

DOE, 2005b, Final Design Report and Design Calculation Documentation for the Accelerated Action for the Original Landfill at the Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

Metcalf & Eddy, 1995, Draft Geotechnical Investigation Report for Operable Unit No. 5, ME-EEG-T-0009, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

Attachment A

**Construction Completion and Certification Report Accelerated Action for the Original
Landfill Rocky Flats Environmental Technology Site, Text and Appendices A - J**

IHSS GROUP SW-2
ORIGINAL LANDFILL (IHSS-115 & 196)

ACCELERATED ACTION FOR THE ORIGINAL LANDFILL
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
CONSTRUCTION COMPLETION AND CERTIFICATION REPORT

ATTACHMENT A OF THE
DRAFT CLOSEOUT REPORT

VOLUME I

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September 2005



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